

SRA Life, Earth, and Physical Science Laboratories
correlation to
Kansas Science Education Standards
Grades 5-7

SRA Life, Earth, and Physical Science Laboratories provide core science content in an alternate reading format. Each *SRA Science Lab* contains 180 Science Cards covering key science concepts and vocabulary. Each lab covers 90 different science topics presented at two different reading levels to meet varied student abilities. The *Teacher's Handbook* includes hands-on inquiry activities as well as vocabulary building exercises. The *Classroom Resource CD-ROM* includes Writing Strategies in Science along with tests and vocabulary games.

Standard 1: SCIENCE AS INQUIRY

Science as Inquiry: The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.

Benchmark 1: The student will demonstrate abilities necessary to do the processes of scientific inquiry.

1. The student identifies questions that can be answered through scientific inquiry.

Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells*, pages 77-79; Hands-On Activity 2, *Culturing Bacteria*, pages 81-83; Hands-On Activity 3, *Investigating Arthropods*, pages 85-87; Hands-On Activity 4, *Your Cardiovascular System*, pages 89-91; Hands-On Activity 5, *Making Fossils*, pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?*, pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103

Earth Science Lab Teacher's Handbook: Hands-On Activity 1, *Identifying Minerals with the Mohs Scale*, pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map*, pages 81-83; Hands-On Activity 4, *Using Sound Waves*, pages 85-87; Hands-On Activity 5, *What is in the Air?*, pages 89-91; Hands-On Activity 6, *Modeling a Tornado*, pages 93-95; Hands-On Activity 7, *Sizes in the Solar System*, pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

Physical Science Lab Teacher's Handbook: Hands-On Activity 1, *Measuring pH of Acids and Bases*, pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates*, pages 81-83; Hands-On Activity 3, *Energy Conversion*, pages 85-87; Hands-On Activity 4, *Reducing Friction*, pages 89-91; Hands-On Activity 5, *Making a Potato Battery*, pages 93-95; Hands-On Activity 6, *Making Sound*, pages 97-99

Classroom Resource CD-ROM: Writing Strategy 15

Standard 1: SCIENCE AS INQUIRY

Science as Inquiry: The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.

Benchmark 1: The student will demonstrate abilities necessary to do the processes of scientific inquiry.

2. The student designs and conducts scientific investigations safely using appropriate tools, mathematics, technology, and techniques to gather, analyze, and interpret data.

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Classroom Resource CD-ROM: Writing Strategy 15, 22, 24

Standard 1: SCIENCE AS INQUIRY
Science as Inquiry: The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.
Benchmark 1: The student will demonstrate abilities necessary to do the processes of scientific inquiry.
3. The student identifies the relationship between evidence and logical conclusions.
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Classroom Resource CD-ROM: Writing Strategy 18

Standard 1: SCIENCE AS INQUIRY
Science as Inquiry: The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.
Benchmark 1: The student will demonstrate abilities necessary to do the processes of scientific inquiry.
4. The student communicates scientific procedures, results, and explanations.
Life Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Examining Cells</i> , pages 77-79; Hands-On Activity 2, <i>Culturing Bacteria</i> , pages 81-83; Hands-On Activity 3, <i>Investigating Arthropods</i> , pages 85-87; Hands-On Activity 4, <i>Your Cardiovascular System</i> , pages 89-91; Hands-On Activity 5, <i>Making Fossils</i> , pages 93-95; Hands-On Activity 6, <i>How Much Does Energy Cost?</i> , pages 97-99; Hands-On Activity 7, <i>The Effects of Acid Rain</i> , pages 101-103
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Classroom Resource CD-ROM: Writing Strategy 15

Standard 1: SCIENCE AS INQUIRY
Science as Inquiry: The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.
Benchmark 2: The student will apply different kinds of investigations to different kinds of questions.
1. The student develops questions and adapts (frames) the inquiry process to guide the appropriate type of investigation.
<p>Life Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Examining Cells</i>, pages 77-79; Hands-On Activity 2, <i>Culturing Bacteria</i>, pages 81-83; Hands-On Activity 3, <i>Investigating Arthropods</i>, pages 85-87; Hands-On Activity 4, <i>Your Cardiovascular System</i>, pages 89-91; Hands-On Activity 5, <i>Making Fossils</i>, pages 93-95; Hands-On Activity 6, <i>How Much Does Energy Cost?</i>, pages 97-99; Hands-On Activity 7, <i>The Effects of Acid Rain</i>, pages 101-103</p> <p>Earth Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Identifying Minerals with the Mohs Scale</i>, pages 73-75; Hands-On Activity 2, <i>Plate Boundaries in Action</i>, pages 77-79; Hands-On Activity 3, <i>Interpreting a Topographic Map</i>, pages 81-83; Hands-On Activity 4, <i>Using Sound Waves</i>, pages 85-87; Hands-On Activity 5, <i>What is in the Air?</i>, pages 89-91; Hands-On Activity 6, <i>Modeling a Tornado</i>, pages 93-95; Hands-On Activity 7, <i>Sizes in the Solar System</i>, pages 97-99; Hands-On Activity 8, <i>Temperature, Salinity, and Water Density</i>, pages 101-103</p> <p>Physical Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Measuring pH of Acids and Bases</i>, pages 77-79; Hands-On Activity 2, <i>Chemical Reaction Rates</i>, pages 81-83; Hands-On Activity 3, <i>Energy Conversion</i>, pages 85-87; Hands-On Activity 4, <i>Reducing Friction</i>, pages 89-91; Hands-On Activity 5, <i>Making a Potato Battery</i>, pages 93-95; Hands-On Activity 6, <i>Making Sound</i>, pages 97-99</p> <p>Classroom Resource CD-ROM: Writing Strategy 8, 15</p>

Standard 1: SCIENCE AS INQUIRY
Science as Inquiry: The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.
Benchmark 2: The student will apply different kinds of investigations to different kinds of questions.
2. The student differentiates between qualitative and quantitative data in an investigation.
<p>Life Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Examining Cells</i>, pages 77-79; Hands-On Activity 2, <i>Culturing Bacteria</i>, pages 81-83; Hands-On Activity 3, <i>Investigating Arthropods</i>, pages 85-87; Hands-On Activity 4, <i>Your Cardiovascular System</i>, pages 89-91; Hands-On Activity 5, <i>Making Fossils</i>, pages 93-95; Hands-On Activity 6, <i>How Much Does Energy Cost?</i>, pages 97-99; Hands-On Activity 7, <i>The Effects of Acid Rain</i>, pages 101-103</p> <p>Earth Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Identifying Minerals with the Mohs Scale</i>, pages 73-75; Hands-On Activity 2, <i>Plate Boundaries in Action</i>, pages 77-79; Hands-On Activity 3, <i>Interpreting a Topographic Map</i>, pages 81-83; Hands-On Activity 4, <i>Using Sound Waves</i>, pages 85-87; Hands-On Activity 5, <i>What is in the Air?</i>, pages 89-91; Hands-On Activity 6, <i>Modeling a Tornado</i>, pages 93-95; Hands-On Activity 7, <i>Sizes in the Solar System</i>, pages 97-99; Hands-On Activity 8, <i>Temperature, Salinity, and Water Density</i>, pages 101-103</p> <p>Physical Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Measuring pH of Acids and Bases</i>, pages 77-79; Hands-On Activity 2, <i>Chemical Reaction Rates</i>, pages 81-83; Hands-On Activity 3, <i>Energy Conversion</i>, pages 85-87; Hands-On Activity 4, <i>Reducing Friction</i>, pages 89-91; Hands-On Activity 5, <i>Making a Potato Battery</i>, pages 93-95; Hands-On Activity 6, <i>Making Sound</i>, pages 97-99</p> <p>Classroom Resource CD-ROM: Writing Strategy 22, 24</p>

Standard 1: SCIENCE AS INQUIRY
Science as Inquiry: The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.
Benchmark 3: The student will analyze how science advances through the interaction of new ideas, scientific investigations, skepticism, and examinations of evidence of varied explanations.
1. The student after completing an investigation, generates alternative methods of investigation and/or further questions for inquiry.
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Standard 1: SCIENCE AS INQUIRY
Science as Inquiry: The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.
Benchmark 3: The student will analyze how science advances through the interaction of new ideas, scientific investigations, skepticism, and examinations of evidence of varied explanations.
2. The student evaluates the work of others to determine evidence which scientifically supports or contradicts the results, identifying faulty reasoning or conclusions that go beyond evidence and/or are not supported by data.
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Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 1: The student will observe, compare, and classify properties of matter.
1. The student compares and classifies the states of matter: solids, liquids, gases, and plasma.
Physical Science Lab, Level A: Cards 5, 6, 7
Physical Science Lab, Level B: Cards 5, 6, 7

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 1: The student will observe, compare, and classify properties of matter.
2. The student compares and contrasts the classes of matter: elements, compounds, and mixtures.
Physical Science Lab, Level A: Cards 10, 11, 12, 13
Physical Science Lab, Level B: Cards 10, 11, 12, 13

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 1: The student will observe, compare, and classify properties of matter.
3. The student identifies and communicates properties of matter including but not limited to, boiling point, solubility, and density.
Physical Science Lab, Level A: Cards 1, 2, 6, 8
Physical Science Lab, Level B: Cards 1, 2, 6, 8

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 2: The student will observe, measure, infer, and classify changes in properties of matter.
1. The student understands the relationship of atoms to elements and elements to compounds.
Physical Science Lab, Level A: Cards 3, 4, 10, 11
Physical Science Lab, Level B: Cards 3, 4, 10, 11

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 2: The student will observe, measure, infer, and classify changes in properties of matter.
2. The student measures and graphs the effects of temperature on matter.
Physical Science Lab, Level A: Cards 6, 7, 8, 42
Physical Science Lab, Level B: Cards 6, 7, 8, 42

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 3: The student will investigate motion and forces.
1. The student identifies the forces that act on an object (e.g., gravity and friction).
Physical Science Lab, Level A: Cards 54, 57, 58, 59
Physical Science Lab, Level B: Cards 54, 57, 58, 59
Physical Science Lab Teacher's Handbook: Hands-On Activity 4, <i>Reducing Friction</i>, pages 89-91

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 3: The student will investigate motion and forces.
2. The student describes, measures, and represents data on a graph showing the motion of an object (position, direction of motion, speed).
Physical Science Lab, Level A: Cards 50, 51, 52, 53
Physical Science Lab, Level B: Cards 50, 51, 52, 53

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 3: The student will investigate motion and forces.
3. The student recognizes and describes examples of Newton’s Laws of Motion.
Physical Science Lab, Level A: Cards 55, 56
Physical Science Lab, Level B: Cards 55, 56

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 3: The student will investigate motion and forces.
4. The student investigates and explains how simple machines multiply force at the expense of distance.
Physical Science Lab, Level A: Cards 63, 64
Physical Science Lab, Level B: Cards 63, 64

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 4: The student will understand and demonstrate the transfer of energy.
1. The student understands the difference between potential and kinetic energy.
Physical Science Lab, Level A: Cards 36, 37, 39, 40, 41, 42
Physical Science Lab, Level B: Cards 36, 37, 39, 40, 41, 42
Physical Science Lab Teacher’s Handbook: Hands-On Activity 3, <i>Energy Conversion</i> , pages 85-87

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 4: The student will understand and demonstrate the transfer of energy.
2. The student understands that when work is done energy transforms from one form to another, including mechanical, heat, light, sound, electrical, chemical, and nuclear energy, yet is conserved.
Physical Science Lab, Level A: Cards 34, 36, 37, 41, 42, 45, 46, 47, 48, 49, 66, 67, 76, 78, 79, 80, 82, 83
Physical Science Lab, Level B: Cards 34, 36, 37, 41, 42, 45, 46, 47, 48, 49, 66, 67, 76, 78, 79, 80, 82, 83
Physical Science Lab Teacher’s Handbook: Hands-On Activity 3, <i>Energy Conversion</i> , pages 85-87; Hands-On Activity 5, <i>Making a Potato Battery</i> , pages 93-95; Hands-On Activity 6, <i>Making Sound</i> , pages 97-99

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 4: The student will understand and demonstrate the transfer of energy.
3. The student observes and communicates how light (electromagnetic) energy interacts with matter: transmitted, reflected, refracted, and absorbed).
Physical Science Lab, Level A: Cards 82, 83, 84, 85, 86, 87, 88, 89, 90
Physical Science Lab, Level B: Cards 82, 83, 84, 85, 86, 87, 88, 89, 90

Standard 2: PHYSICAL SCIENCE
Physical Science: The student will apply process skills to develop an understanding of physical science including properties, changes of properties of matter, motion and forces, and transfer of energy.
Benchmark 4: The student will understand and demonstrate the transfer of energy.
4. The student understands that heat energy can be transferred from hot to cold by radiation, convection, and conduction.
Physical Science Lab, Level A: Cards 42, 43, 44
Physical Science Lab, Level B: Cards 42, 43, 44

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 1: The student will model structures of organisms and relate functions to the structures.
1. The student will understand the cell theory: that all organisms are composed of one or more cells, cells are the basic unit of life, and that cells come from other cells.
Life Science Lab, Level A: Cards 1, 5, 6, 7, 8, 9, 10
Life Science Lab, Level B: Cards 1, 5, 6, 7, 8, 9, 10
Life Science Lab Teacher's Handbook: Hands-On Activity 1, <i>Examining Cells</i> , pages 77-79

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 1: The student will model structures of organisms and relate functions to the structures.
2. The student relates the structure of cells, organs, tissues, organ systems, and whole organisms to their functions.
Life Science Lab, Level A: Cards 5, 6, 7, 8, 9, 10, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58
Life Science Lab, Level B: Cards 5, 6, 7, 8, 9, 10, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58
Life Science Lab Teacher's Handbook: Hands-On Activity 1, <i>Examining Cells</i> , pages 77-79; Hands-On Activity 4, <i>Your Cardiovascular System</i> , pages 89-91

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 1: The student will model structures of organisms and relate functions to the structures.
3. The student compares organisms composed of single cells with organisms that are multi-cellular.
Life Science Lab, Level A: Cards 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Life Science Lab, Level B: Cards 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Life Science Lab Teacher's Handbook: Hands-On Activity 2, <i>Culturing Bacteria</i> , pages 81-83; Hands-On Activity 3, <i>Investigating Arthropods</i> , pages 85-87

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 1: The student will model structures of organisms and relate functions to the structures.
4. The student concludes that breakdowns in structure or function may be caused by disease, damage, heredity, or aging.
Life Science Lab, Level A: Cards 47, 49, 51, 53, 55, 57
Life Science Lab, Level B: Cards 47, 49, 51, 53, 55, 57

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 2: The student will understand the role of reproduction and heredity for all living things.
1. The student differentiates between asexual and sexual reproduction of organisms.
Life Science Lab, Level A: Cards 60, 61
Life Science Lab, Level B: Cards 60, 61

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 2: The student will understand the role of reproduction and heredity for all living things.
2. The student understands how heredity information of each cell is passed from one generation to the next.
Life Science Lab, Level A: Cards 61, 62, 63, 64
Life Science Lab, Level B: Cards 61, 62, 63, 64

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 2: The student will understand the role of reproduction and heredity for all living things.
3. The student infers that the characteristics of an organism result from heredity and interactions with the environment.
Life Science Lab, Level A: Cards 23, 24, 41, 42, 62, 63, 64
Life Science Lab, Level B: Cards 23, 24, 41, 43, 62, 63, 65

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 3: The student will describe homeostasis, the regulation and balance of internal conditions in response to a changing external environment.
1. The student understands that internal and/or environmental conditions affect an organism's behavior and/or response in order to maintain and regulate stable internal conditions to survive in a continually changing environment.
Life Science Lab, Level A: Cards 24, 36, 43, 44, 83
Life Science Lab, Level B: Cards 24, 36, 43, 44, 83

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 3: The student will describe homeostasis, the regulation and balance of internal conditions in response to a changing external environment.
2. The student recognizes that the survival of all organisms requires the ingestion of materials, the intake and release of energy, growth, release of wastes and responses to environmental change.
Life Science Lab, Level A: Cards 1, 9, 16, 17, 45, 46, 73, 74, 75, 76
Life Science Lab, Level B: Cards 1, 9, 16, 17, 45, 46, 73, 74, 75, 76

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 4: The student will identify and relate interactions of populations of organisms within an ecosystem.
1. The student recognizes that all populations living together (biotic resources) and the physical factors (abiotic resources) with which they interact compose an ecosystem.
Life Science Lab, Level A: Cards 70, 71, 72, 73, 74, 75, 81, 82
Life Science Lab, Level B: Cards 70, 71, 72, 73, 74, 75, 81, 82

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 4: The student will identify and relate interactions of populations of organisms within an ecosystem.
2. The student understands how limiting factors determine the carrying capacity of an ecosystem.
Life Science Lab, Level A: Card 72
Life Science Lab, Level B: Card 72

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 4: The student will identify and relate interactions of populations of organisms within an ecosystem.
3. The student traces the energy flow from the sun (source of radiant energy) to producers (via photosynthesis-chemical energy) to consumers and decomposers in food webs.
Life Science Lab, Level A: Cards 13, 16, 17, 76, 77
Life Science Lab, Level B: Cards 13, 16, 17, 76, 77
Life Science Lab Teacher's Handbook: Hands-On Activity 6, <i>How Much Does Energy Cost?</i> , pages 97-99

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 5: The student will observe the diversity of living things and relate their adaptations to their survival or extinction.
1. The student concludes that species of animals, plants, and microorganisms may look dissimilar on the outside but have similarities in internal structures, developmental characteristics, chemical processes, and genomes.
Life Science Lab, Level A: Cards 2, 3, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Life Science Lab, Level B: Cards 2, 3, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Life Science Lab Teacher's Handbook: Hands-On Activity 1, <i>Examining Cells</i> , pages 77-79; Hands-On Activity 2, <i>Culturing Bacteria</i> , pages 81-83; Hands-On Activity 3, <i>Investigating Arthropods</i> , pages 85-87

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 5: The student will observe the diversity of living things and relate their adaptations to their survival or extinction.
2. The student understands that adaptations of organisms (changes in structure, function, or behavior that accumulate over successive generations) contribute to biological diversity.
Life Science Lab, Level A: Cards 23, 41, 65, 66 Life Science Lab, Level B: Cards 23, 41, 65, 66

Standard 3: LIFE SCIENCE
Life Science: The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.
Benchmark 5: The student will observe the diversity of living things and relate their adaptations to their survival or extinction.
3. The student associates extinction of a species with environmental changes and insufficient adaptive characteristics.
Life Science Lab, Level A: Cards 67, 86 Life Science Lab, Level B: Cards 67, 86
Earth Science Lab, Level A: Cards 34, 61 Earth Science Lab, Level B: Cards 34, 61

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will apply process skills to explore and develop an understanding of the structure of the Earth system, Earth’s history, and Earth in the solar system.
Benchmark 1. The student will understand that the structure of the Earth system is continually changing due to earth’s physical and chemical processes.
1. The student identifies properties of the solid earth, the oceans and fresh water, and the atmosphere.
Earth Science Lab, Level A: Cards 1, 2, 3, 4, 5, 6, 7, 8, 9, 36, 37, 38, 39, 40, 41, 82, 83, 84 Earth Science Lab, Level B: Cards 1, 2, 3, 4, 5, 6, 7, 8, 9, 36, 37, 38, 39, 40, 41, 82, 83, 84 Earth Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Identifying Minerals with the Mohs Scale</i> , pages 73-75; Hands-On Activity 5, <i>What is in the Air?</i> , pages 89-91; Hands-On Activity 8, <i>Temperature, Salinity, and Water Density</i> , pages 101-103

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will apply process skills to explore and develop an understanding of the structure of the Earth system, Earth’s history, and Earth in the solar system.
Benchmark 1. The student will understand that the structure of the Earth system is continually changing due to earth’s physical and chemical processes.
2. The student models Earth’s cycles, constructive and destructive processes, and weather systems.
Life Science Lab, Level A: Cards 78, 79 Life Science Lab, Level B: Cards 78, 79
Earth Science Lab, Level A: Cards 10, 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, 28, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 52, 53, 54 Earth Science Lab, Level B: Cards 10, 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, 28, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 52, 53, 54 Earth Science Lab Teacher’s Handbook: Hands-On Activity 2, <i>Plate Boundaries in Action</i> , pages 77-79; Hands-On Activity 6, <i>Modeling a Tornado</i> , pages 93-95

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will apply process skills to explore and develop an understanding of the structure of the Earth system, Earth’s history, and Earth in the solar system.
Benchmark 2. The student will understand past and present Earth processes and their similarity.
1. The student understands that Earth processes observed today (including movement of lithospheric plates and changes in atmospheric conditions) are similar to those that occurred in the past; Earth history is also influenced by occasional catastrophes, such as the impact of a comet or asteroid.
Earth Science Lab, Level A: Cards 10, 11, 12, 13, 14, 15, 16, 17, 22, 24, 25, 26, 27, 28, 60, 73
Earth Science Lab, Level B: Cards 10, 11, 12, 13, 14, 15, 16, 17, 22, 24, 25, 26, 27, 28, 60, 73
Earth Science Lab Teacher’s Handbook: Hands-On Activity 2, <i>Plate Boundaries in Action</i> , pages 77-79

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will apply process skills to explore and develop an understanding of the structure of the Earth system, Earth’s history, and Earth in the solar system.
Benchmark 3. The student will identify and classify stars, planets, and other solar system components.
1. The student compares and contrasts the characteristics of stars, planets, moons, comets, and asteroids.
Earth Science Lab, Level A: Cards 68, 69, 70, 71, 72, 73, 75, 76
Earth Science Lab, Level B: Cards 68, 69, 70, 71, 72, 73, 75, 76
Earth Science Lab Teacher’s Handbook: Hands-On Activity 7, <i>Sizes in the Solar System</i> , pages 97-99

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will apply process skills to explore and develop an understanding of the structure of the Earth system, Earth’s history, and Earth in the solar system.
Benchmark 3. The student will identify and classify stars, planets, and other solar system components.
2. The student models spatial relationships of the earth/moon/planets/sun system to scale.
Earth Science Lab, Level A: Cards 68, 69, 70, 71, 72, 74
Earth Science Lab, Level B: Cards 68, 69, 70, 71, 72, 74
Earth Science Lab Teacher’s Handbook: Hands-On Activity 7, <i>Sizes in the Solar System</i> , pages 97-99

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will apply process skills to explore and develop an understanding of the structure of the Earth system, Earth’s history, and Earth in the solar system.
Benchmark 3. The student will identify and classify stars, planets, and other solar system components.
3. The student identifies past and present methods used to explore space.
Earth Science Lab, Level A: Cards 70, 79, 80, 81
Earth Science Lab, Level B: Cards 70, 79, 80, 81

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will apply process skills to explore and develop an understanding of the structure of the Earth system, Earth’s history, and Earth in the solar system.
Benchmark 4: The student will model motions and identify forces that explain Earth phenomena.
1. The student demonstrates and models object/space/time relationships that explain phenomena such as the day, the month, the year, seasons, phases of the moon, eclipses and tides.
Earth Science Lab, Level A: Cards 55, 62, 64, 65, 66
Earth Science Lab, Level B: Cards 55, 62, 64, 65, 66

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will apply process skills to explore and develop an understanding of the structure of the Earth system, Earth’s history, and Earth in the solar system.
Benchmark 4: The student will model motions and identify forces that explain Earth phenomena.
2. The student understands the effect of the angle of incidence of solar energy striking Earth’s surface on the amount of heat energy absorbed at Earth’s surface.
Earth Science Lab, Level A: Cards 55, 62
Earth Science Lab, Level B: Cards 55, 62

Standard 5: SCIENCE AND TECHNOLOGY
Science and Technology
Benchmark 1: The student will demonstrate abilities of technical design.
1. The student identifies appropriate problems for technological design, designs a solution or product, implements the proposed design, evaluates the product, and communicates the process of technological design.
This concept is not covered at this level.

Standard 5: SCIENCE AND TECHNOLOGY
Science and Technology
Benchmark 2: The student will develop understandings of the similarities, differences, and relationships in science and technology.
1. The student compares the work of research scientists with that of applied scientists and technologists.
This concept is not covered at this level.

Standard 5: SCIENCE AND TECHNOLOGY
Science and Technology
Benchmark 2: The student will develop understandings of the similarities, differences, and relationships in science and technology.
2. The student evaluates benefits, risks, limitations and trade-offs of technological solutions.
Life Science Lab, Level A: Cards 5, 49, 59, 64, 69, 83, 87, 88, 89, 90
Life Science Lab, Level B: Cards 5, 49, 59, 64, 69, 83, 87, 88, 89, 90
Earth Science Lab, Level A: Cards 16, 20, 31, 37, 42, 51, 54, 70, 79, 80, 81, 86, 88
Earth Science Lab, Level B: Cards 16, 20, 31, 37, 42, 51, 54, 70, 79, 80, 81, 86, 88
Physical Science Lab, Level A: Cards 33, 34, 35, 63, 64, 71, 72, 73, 76, 81, 84, 90
Physical Science Lab, Level B: Cards 33, 34, 35, 63, 64, 71, 72, 73, 76, 81, 84, 90

Standard 5: SCIENCE AND TECHNOLOGY
Science and Technology
Benchmark 2: The student will develop understandings of the similarities, differences, and relationships in science and technology.
3. The student identifies contributions to science and technology by many people and many cultures.
Life Science Lab, Level A: Cards 2, 5, 46, 59
Life Science Lab, Level B: Cards 2, 5, 46, 59
Earth Science Lab, Level A: Cards 10, 68, 72, 78
Earth Science Lab, Level B: Cards 10, 68, 72, 78
Physical Science Lab, Level A: Cards 3, 7, 17, 55
Physical Science Lab, Level B: Cards 3, 7, 17, 55

Standard 6: SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES
Science in Personal and Environmental Perspectives: The student will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.
Benchmark 1: The student will understand scientific knowledge relative to personal health.
1. The student identifies individual nutrition, exercise, and rest needs based on science and uses a scientific approach to thinking critically about personal health, lifestyle choices, risks and benefits.
Life Science Lab, Level A: Cards 45, 46
Life Science Lab, Level B: Cards 45, 46

Standard 6: SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES
Science in Personal and Environmental Perspectives: The student will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.
Benchmark 2: The student will understand the impact of human activity on resources and environment.
1. The student investigates the effects of human activities on the environment and analyzes decisions based on the knowledge of benefits and risks.
Life Science Lab, Level A: Cards 84, 85, 86, 87, 88, 89, 90
Life Science Lab, Level B: Cards 84, 85, 86, 87, 88, 89, 90
Life Science Lab Teacher’s Handbook: Hands-On Activity 7, <i>The Effects of Acid Rain</i> , pages 101-103
Earth Science Lab, Level A: Cards 37, 42, 59, 60, 61, 86
Earth Science Lab, Level B: Cards 37, 42, 59, 60, 61, 86
Earth Science Lab Teacher’s Handbook: Hands-On Activity 5, <i>What is in the Air?</i> , pages 89-91

Standard 6: SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES
Science in Personal and Environmental Perspectives: The student will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.
Benchmark 3: The student will understand that natural hazards are dynamic examples of earth processes which cause use to evaluate risks.
1. The student recognizes patterns of natural processes and/or human activities that may cause and/or contribute to natural hazards.
Life Science Lab, Level A: Cards 84, 86, 87, 88, 89, 90
Life Science Lab, Level B: Cards 84, 86, 87, 88, 89, 90
Life Science Lab Teacher’s Handbook: Hands-On Activity 7, <i>The Effects of Acid Rain</i> , pages 101-103
Earth Science Lab, Level A: Cards 15, 17, 37, 42, 52, 53, 54, 59, 60, 61, 86
Earth Science Lab, Level B: Cards 15, 17, 37, 42, 52, 53, 54, 59, 60, 61, 86
Earth Science Lab Teacher’s Handbook: Hands-On Activity 5, <i>What is in the Air?</i> , pages 89-91

Standard 6: SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES
Science in Personal and Environmental Perspectives: The student will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.
Benchmark 3: The student will understand that natural hazards are dynamic examples of earth processes which cause use to evaluate risks.
2. The student evaluates risks and defines appropriate actions associated with the natural hazard
Earth Science Lab, Level A: Cards 15, 16, 17, 52, 53, 54, 60
Earth Science Lab, Level B: Cards 15, 16, 17, 52, 53, 54, 60

Standard 7: HISTORY AND NATURE OF SCIENCE
History and Nature of Science: The student will examine and develop an understanding of science as a historic human endeavor.
Benchmark 1. The student will develop scientific habits of mind.
1. The student practices intellectual honesty, demonstrates skepticism appropriately, displays open-mindedness to new ideas, and bases decisions on evidence.
Life Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Examining Cells</i> , pages 77-79; Hands-On Activity 2, <i>Culturing Bacteria</i> , pages 81-83; Hands-On Activity 3, <i>Investigating Arthropods</i> , pages 85-87; Hands-On Activity 4, <i>Your Cardiovascular System</i> , pages 89-91; Hands-On Activity 5, <i>Making Fossils</i> , pages 93-95; Hands-On Activity 6, <i>How Much Does Energy Cost?</i> , pages 97-99; Hands-On Activity 7, <i>The Effects of Acid Rain</i> , pages 101-103
Earth Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Identifying Minerals with the Mohs Scale</i> , pages 73-75; Hands-On Activity 2, <i>Plate Boundaries in Action</i> , pages 77-79; Hands-On Activity 3, <i>Interpreting a Topographic Map</i> , pages 81-83; Hands-On Activity 4, <i>Using Sound Waves</i> , pages 85-87; Hands-On Activity 5, <i>What is in the Air?</i> , pages 89-91; Hands-On Activity 6, <i>Modeling a Tornado</i> , pages 93-95; Hands-On Activity 7, <i>Sizes in the Solar System</i> , pages 97-99; Hands-On Activity 8, <i>Temperature, Salinity, and Water Density</i> , pages 101-103
Physical Science Lab Teacher’s Handbook: Hands-On Activity 1, <i>Measuring pH of Acids and Bases</i> , pages 77-79; Hands-On Activity 2, <i>Chemical Reaction Rates</i> , pages 81-83; Hands-On Activity 3, <i>Energy Conversion</i> , pages 85-87; Hands-On Activity 4, <i>Reducing Friction</i> , pages 89-91; Hands-On Activity 5, <i>Making a Potato Battery</i> , pages 93-95; Hands-On Activity 6, <i>Making Sound</i> , pages 97-99

Standard 7: HISTORY AND NATURE OF SCIENCE
History and Nature of Science: The student will examine and develop an understanding of science as a historic human endeavor.
Benchmark 2: The student will research contributions to science throughout history.
1. The student recognizes that new knowledge leads to new questions and new discoveries, replicates historic experiments to understand principles of science, and relates contributions of men and women to the fields of science.
Life Science Lab, Level A: Cards 2, 5, 46, 59, 64, 65, 67, 69 Life Science Lab, Level B: Cards 2, 5, 46, 59, 64, 65, 67, 69
Earth Science Lab, Level A: Cards 10, 30, 31, 51, 54, 68, 72, 78, 79, 80 Earth Science Lab, Level B: Cards 10, 30, 31, 51, 54, 68, 72, 78, 79, 80
Physical Science Lab, Level A: Cards 3, 7, 17, 35, 53, 55, 59, 81, 84, 90 Physical Science Lab, Level B: Cards 3, 7, 17, 35, 53, 55, 59, 81, 84, 90

SRA Life, Earth, and Physical Science Laboratories
correlation to
Kansas Science Education Standards
Grade 8/Life Science/Physical Science

SRA Life, Earth, and Physical Science Laboratories provide core science content in an alternate reading format. Each *SRA Science Lab* contains 180 Science Cards covering key science concepts and vocabulary. Each lab covers 90 different science topics presented at two different reading levels to meet varied student abilities. The *Teacher's Handbook* includes hands-on inquiry activities as well as vocabulary building exercises. The *Classroom Resource CD-ROM* includes Writing Strategies in Science along with tests and vocabulary games.

Standard 4: EARTH AND SPACE SCIENCE

Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.

Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.

4.1.1 The student understands constructive and destructive processes, including weathering, erosion and deposition, dynamically reshape the surface of the earth.

a. The rock cycle describes constructive and destructive processes that change the forms of rocks and soils (solid earth).

Earth Science Lab, Level A: Cards 6, 7, 8, 9, 23, 29

Earth Science Lab, Level B: Cards 6, 7, 8, 9, 23, 29

Standard 4: EARTH AND SPACE SCIENCE

Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.

Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.

4.1.1 The student understands constructive and destructive processes, including weathering, erosion and deposition, dynamically reshape the surface of the earth.

b. Water, glaciers, wind, waves, and gravity are weathering and erosion agents.

Earth Science Lab, Level A: Cards 22, 24, 25, 26, 27, 28

Earth Science Lab, Level B: Cards 22, 24, 25, 26, 27, 28

Standard 4: EARTH AND SPACE SCIENCE

Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.

Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.

4.1.2 The student understands the theory of Plate Tectonics explains that internal energy drives the earth's ever changing structure.

a. Movable continental and oceanic plates make up earth's surface; the hot, convecting mantle is the energy source for plate movement.

Earth Science Lab, Level A: Cards 1, 2, 10, 11, 12, 13, 14, 15, 16, 17

Earth Science Lab, Level B: Cards 1, 2, 10, 11, 12, 13, 14, 15, 16, 17

Earth Science Lab Teacher's Handbook: Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.2 The student understands the theory of Plate Tectonics explains that internal energy drives the earth's ever changing structure.
b. Essentially all energy on earth originates with the sun, is generated by radioactive decay in earth's interior, or is left over from earth's formation.
Earth Science Lab, Level A: Cards 31, 35, 38, 78 Earth Science Lab, Level B: Cards 31, 35, 38, 78
Physical Science Lab, Level A: Cards 33, 38, 42, 44, 46, 47, 48, 49 Physical Science Lab, Level B: Cards 33, 38, 42, 44, 46, 47, 48, 49

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.2 The student understands the theory of Plate Tectonics explains that internal energy drives the earth's ever changing structure.
c. Convection circulation in the mantle is driven by the outward transfer of earth's internal heat.
Earth Science Lab, Level A: Cards 1, 10, 11, 12, 13, 14, 15, 17 Earth Science Lab, Level B: Cards 1, 10, 11, 12, 13, 14, 15, 17 Earth Science Lab Teacher's Handbook: Hands-On Activity 2, <i>Plate Boundaries in Action</i> , pages 77-79

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.2 The student understands the theory of Plate Tectonics explains that internal energy drives the earth's ever changing structure.
d. Systems on earth's surface are powered principally by the sun and contain an essentially fixed amount of each stable chemical atom or element.
Earth Science Lab, Level A: Cards 22, 24, 25, 26, 27, 28, 36, 37, 38, 43, 44, 82, 87 Earth Science Lab, Level B: Cards 22, 24, 25, 26, 27, 28, 36, 37, 38, 43, 44, 82, 87
Physical Science Lab, Level A: Cards 44, 46 Physical Science Lab, Level B: Cards 44, 46

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.2 The student understands the theory of Plate Tectonics explains that internal energy drives the earth's ever changing structure.
e. Rocks, water, CO₂/O₂, carbon, and other nutrients cycle through different forms as a result of cycle biological and geologic processes.
Life Science Lab, Level A: Cards 9, 17, 78, 79 Life Science Lab, Level B: Cards 9, 17, 78, 79
Earth Science Lab, Level A: Cards 9, 47, 48, 49, 82, 83, 84, 87 Earth Science Lab, Level B: Cards 9, 47, 48, 49, 82, 83, 84, 87

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
a. Energy from the sun heats the oceans and the atmosphere, and drives oceanic and atmospheric circulation.
Earth Science Lab, Level A: Cards 36, 37, 38, 39, 40, 41, 45, 46, 87 Earth Science Lab, Level B: Cards 36, 37, 38, 39, 40, 41, 45, 46, 87
Physical Science Lab, Level A: Cards 44, 46, 47 Physical Science Lab, Level B: Cards 44, 46, 47

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
b. Human activity impacts global climate. Example: Burning of fossil fuels produces ground level features, cloud cover, and earth's rotation.
Life Science Lab, Level A: Cards 89, 90 Life Science Lab, Level B: Cards 89, 90 Life Science Lab Teacher's Handbook: Hands-On Activity 7, <i>The Effects of Acid Rain</i> , pages 101-103
Earth Science Lab, Level A: Cards 37, 42, 59, 60, 61 Earth Science Lab, Level B: Cards 37, 42, 59, 60, 61 Earth Science Lab Teacher's Handbook: Hands-On Activity 5, <i>What is in the Air?</i> , pages 89-91

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
c. The composition and structure of earth's atmosphere is a factor in the earth's suitability to support life.
Earth Science Lab, Level A: Cards 36, 37, 38, 39, 40, 41, 42 Earth Science Lab, Level B: Cards 36, 37, 38, 39, 40, 41, 42

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
d. Weather patterns and seasonal weather change are multi-variable phenomena.
Earth Science Lab, Level A: Cards 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 Earth Science Lab, Level B: Cards 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 Earth Science Lab Teacher's Handbook: Hands-On Activity 6, <i>Modeling a Tornado</i> , pages 93-95

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
e. Biogeochemical cycles are an example of the integration of earth, physical, and biological science concepts.
Life Science Lab, Level A: Cards 9, 17, 78, 79 Life Science Lab, Level B: Cards 9, 17, 78, 79
Earth Science Lab, Level A: Cards 9, 47, 48, 49, 82, 83, 84, 87 Earth Science Lab, Level B: Cards 9, 47, 48, 49, 82, 83, 84, 87

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
f. Weather in the troposphere redistributes water on the surface of the earth through the water cycle.
Earth Science Lab, Level A: Cards 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 56, 82, 83, 84, 87
Earth Science Lab, Level B: Cards 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 56, 82, 83, 84, 87

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
g. The ozone layer in the upper stratosphere filters UV radiation which is harmful to living things.
Earth Science Lab, Level A: Cards 36, 37
Earth Science Lab, Level B: Cards 36, 37

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Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
h. Gamma radiation and other high energy radiation from the sun are filtered by the upper atmosphere.
Earth Science Lab, Level A: Cards 36, 37
Earth Science Lab, Level B: Cards 36, 37

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Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 1. The student will develop an understanding of the sources of energy that power the subsystems and cycles of the dynamic earth: the geosphere, hydrosphere, atmosphere, and biosphere.
4.1.3 The student understands the ultimate source of atmospheric and oceanic energy comes from the Sun. Energy flow drives climate and weather. Climate and weather are influenced by geographic features, cloud cover, and the earth's rotation.
i. Concepts and skills include basic weather forecasting, weather maps, fronts, pressure systems, severe storms and safety precautions.
Earth Science Lab, Level A: Cards 39, 40, 41, 45, 46, 50, 51, 52, 53, 54
Earth Science Lab, Level B: Cards 39, 40, 41, 45, 46, 50, 51, 52, 53, 54
Earth Science Lab Teacher's Handbook: Hands-On Activity 6, <i>Modeling a Tornado</i> , pages 93-95

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 2. The student will develop an understanding of the origin and development of the dynamic earth system.
4.2.1 The student understands geological time is used to understand the earth's past.
a. Radioactive dating and relative dating (i.e., stratigraphy, fossils) are used to estimate the time rocks were formed.
Earth Science Lab, Level A: Cards 30, 31, 34
Earth Science Lab, Level B: Cards 30, 31, 34

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Benchmark 2. The student will develop an understanding of the origin and development of the dynamic earth system.
4.2.1 The student understands geological time is used to understand the earth's past.
b. Earth changes can be short term (during a human's lifetime), such as earthquakes and volcanic eruptions, or long term (over a geological time scale), such as mountain building and plate movements.
Earth Science Lab, Level A: Cards 11, 12, 13, 14, 15, 17, 21, 22, 23, 24, 25, 26, 27, 28, 32, 33, 35
Earth Science Lab, Level B: Cards 11, 12, 13, 14, 15, 17, 21, 22, 23, 24, 25, 26, 27, 28, 32, 33, 35

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 2. The student will develop an understanding of the origin and development of the dynamic earth system.
4.2.1 The student understands geological time is used to understand the earth's past.
c. The earth's atmosphere has changed over time. For example: The dramatic changes in earth's atmosphere (i.e., introduction of O₂) which were affected by the emergence of life on earth.
Earth Science Lab, Level A: Cards 17, 36
Earth Science Lab, Level B: Cards 17, 36

Standard 4: EARTH AND SPACE SCIENCE
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Benchmark 2. The student will develop an understanding of the origin and development of the dynamic earth system.
4.2.1 The student understands geological time is used to understand the earth's past.
d. Relates geologic evidence to a record of earth's history.
Life Science Lab, Level A: Card 67
Life Science Lab, Level B: Card 67
Life Science Lab Teacher's Handbook: Hands-On Activity 5, <i>Making Fossils</i> , pages 93-95
Earth Science Lab, Level A: Cards 11, 12, 13, 14, 30, 31, 32, 33, 34, 35
Earth Science Lab, Level B: Cards 11, 12, 13, 14, 30, 31, 32, 33, 34, 35
Earth Science Lab Teacher's Handbook: Hands-On Activity 2, <i>Plate Boundaries in Action</i> , pages 77-79;

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Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 2. The student will develop an understanding of the origin and development of the dynamic earth system.
4.2.1 The student understands geological time is used to understand the earth's past.
e. Matching coastlines, similarities in rock types, similarities in fossils and life forms suggest that today's continents are separated parts of what was long ago a single continent.
Earth Science Lab, Level A: Card 10 Earth Science Lab, Level B: Card 10

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Benchmark 3. The student develop and understanding of dynamics of our solar system.
4.3.1 The student understands gravitational attraction of objects n the solar system keeps solar system objects in orbit.
a. Kepler's laws describe planetary motion.
Earth Science Lab, Level A: Cards 62, 68 Earth Science Lab, Level B: Cards 62, 68
Physical Science Lab, Level A: Card 59 Physical Science Lab, Level B: Card 59

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 3. The student develop and understanding of dynamics of our solar system.
4.3.1 The student understands gravitational attraction of objects n the solar system keeps solar system objects in orbit.
b. Newton's laws of inertia and gravity explain orbital motion.
Earth Science Lab, Level A: Cards 62, 68 Earth Science Lab, Level B: Cards 62, 68
Physical Science Lab, Level A: Card 59 Physical Science Lab, Level B: Card 59

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Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 3. The student develop and understanding of dynamics of our solar system.
4.3.1 The student understands gravitational attraction of objects n the solar system keeps solar system objects in orbit.
c. Because of the sun's large mass, the sun is the primary gravitational force in the solar system.
Earth Science Lab, Level A: Cards 62, 68 Earth Science Lab, Level B: Cards 62, 68
Physical Science Lab, Level A: Card 59 Physical Science Lab, Level B: Card 59

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 3. The student develop and understanding of dynamics of our solar system.
4.3.2 The student understands the relationship between the earth, moon, and sun explains the seasons, tides and moon phases.
a. The angle of incidence of solar energy striking earth’s surface effect the amount of heat energy absorbed at earth’s surface.
Earth Science Lab, Level A: Cards 55, 62 Earth Science Lab, Level B: Cards 55, 62

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Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 3. The student develop and understanding of dynamics of our solar system.
4.3.2 The student understands the relationship between the earth, moon, and sun explains the seasons, tides and moon phases.
b. The gravitational relationship between the earth, moon, and sun causes tides.
Earth Science Lab, Level A: Cards 66, 90 Earth Science Lab, Level B: Cards 66, 90 Physical Science Lab, Level A: Card 48 Physical Science Lab, Level B: Card 48

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 3. The student develop and understanding of dynamics of our solar system.
4.3.3 The student understands the relative sizes and distances of objects in the solar system.
Earth Science Lab, Level A: Cards 67, 68, 69, 70, 71, 72, 73, 74 Earth Science Lab, Level B: Cards 67, 68, 69, 70, 71, 72, 73, 74 Earth Science Lab Teacher’s Handbook: Hands-On Activity 7, <i>Sizes in the Solar System</i> , pages 97-99

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 3. The student develop and understanding of dynamics of our solar system.
4.3.4 The student understands the sun, earth, and other objects in the solar system formed from a nebular cloud of dust and gas.
Earth Science Lab, Level A: Card 78 Earth Science Lab, Level B: Card 78

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Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.1 The student understands stellar evolution.
a. Condensation of gases, due to gravity, is a foundation for the formation of stars.
Earth Science Lab, Level A: Cards 75, 76
Earth Science Lab, Level B: Cards 75, 76

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.1 The student understands stellar evolution.
b. The life cycle of the star begins with the nebula, which contains mostly hydrogen and helium. Heavier elements were, and continue to be, made by the nuclear fusion reactions in stars.
Earth Science Lab, Level A: Cards 75, 76
Earth Science Lab, Level B: Cards 75, 76

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Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.1 The student understands stellar evolution.
c. The Hertzsprung-Russell (H-R) diagram is used to classify stars. The sun is a main sequence star.
Earth Science Lab, Level A: Card 75
Earth Science Lab, Level B: Card 75

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Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.1 The student understands stellar evolution.
d. Stars are classified by their color, temperature, age, apparent brightness and distance from earth.
Earth Science Lab, Level A: Card 75
Earth Science Lab, Level B: Card 75

Standard 4: EARTH AND SPACE SCIENCE
Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.2 The student understands the current scientific explanation of the origin and structure of the universe.
a. The formation of the universe began with an expansion of gases from a hot, dense state. By studying the light emitted from distant galaxies, it has been found that galaxies are moving apart from one another.
Earth Science Lab, Level A: Cards 77, 78
Earth Science Lab, Level B: Cards 77, 78

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Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.2 The student understands the current scientific explanation of the origin and structure of the universe.
b. The red shift of light, within the Doppler effect, emitted by distant galaxies supports the conclusion that the universe is expanding.
Earth Science Lab, Level A: Cards 77, 78
Earth Science Lab, Level B: Cards 77, 78

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Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.2 The student understands the current scientific explanation of the origin and structure of the universe.
c. Galaxies are a level of organization of the universe. There are at least 100 billion galaxies in the observable universe. Galaxies are organized into superclusters with large voids between them.
Earth Science Lab, Level A: Card 77
Earth Science Lab, Level B: Card 77

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Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.2 The student understands the current scientific explanation of the origin and structure of the universe.
d. The sun is a second-generation star, which, along with our galaxy (The Milky Way which includes about 100 billion stars) formed billions of years after the Big Bang.
Earth Science Lab, Level A: Cards 67, 77, 78
Earth Science Lab, Level B: Cards 67, 77, 78

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Earth and Space Science: The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.
Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.3 The student understands how the tools of astronomy have revolutionized the study of the universe.
a. Current telescopes can measure across the Electromagnetic-Spectrum.
Earth Science Lab, Level A: Card 81
Earth Science Lab, Level B: Card 81

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Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.3 The student understands how the tools of astronomy have revolutionized the study of the universe.
b. Spectral analysis is used to determine chemical composition and energy of stars.
Earth Science Lab, Level A: Cards 67, 75, 76
Earth Science Lab, Level B: Cards 67, 75, 76

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Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.3 The student understands how the tools of astronomy have revolutionized the study of the universe.
c. Relative mass of objects can be determined by observing motion of objects in space and the effect one object's gravity has on another.
Physical Science Lab, Level A: Cards 57, 59
Physical Science Lab, Level B: Cards 57, 59

Standard 4: EARTH AND SPACE SCIENCE
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Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.3 The student understands how the tools of astronomy have revolutionized the study of the universe.
d. The tools and skills of astronomers have changed through time: ancient astronomy (Stonehenge, Greeks, Chinese, Aristotle) through modern astronomy (Copernicus to present).
Earth Science Lab, Level A: Cards 70, 79, 80, 81
Earth Science Lab, Level B: Cards 70, 79, 80, 81

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Benchmark 4. The student will develop an understanding of the organization of the universe, and its development.
4.4.3 The student understands how the tools of astronomy have revolutionized the study of the universe.
e. Astronomical tools and skills allow astronomers to research phenomena and objects that cannot be observed and measured directly.
Earth Science Lab, Level A: Cards 70, 79, 80, 81
Earth Science Lab, Level B: Cards 70, 79, 80, 81